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Atrial tachyarrhythmia as a presenting symptom leading to the diagnosis of pulmonary sarcoidosis treated with catheter-based ablation

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ABSTRACT

A 55-year-old woman was referred for recurrent palpitations. A 48-hour ambulatory cardiac monitor revealed an atrial tachycardia rate up to 170 beats per minute. A subsequent electrophysiology study revealed atrial fibrillation and both typical and atypical atrial flutter. Computed tomography revealed multiple pulmonary nodules, and an endobronchial ultrasound-guided fine-needle aspiration confirmed the diagnosis of pulmonary sarcoidosis. The patient underwent radiofrequency ablation of the cavotricuspid isthmus and left common, right superior, and right inferior pulmonary vein isolation via cryoablation, without recurrent symptoms.

KEYWORDS Atrial fibrillation; atrial flutter; cardiac sarcoidosis; catheter ablation; electrophysiology; pulmonary sarcoidosis

Sarcoidosis is a granulomatous disease that can affect any organ. Pulmonary sarcoidosis is the most prevalent form. Cardiac sarcoidosis is rare and nearly nonexistent in patients with symptomatic pulmonary sarcoidosis.[1–3] Conduction abnormalities are common in cardiac sarcoidosis, but uncommon in pulmonary sarcoidosis.[4] Such was the case, however, in the patient described herein.

CASE DESCRIPTION

A 55-year-old woman was referred for 5 months of progressive palpitations. Her father had cardiac sarcoidosis and psoriasis and her daughter had ankylosing spondylitis and psoriatic arthritis. Laboratory studies, electrocardiogram, and echocardiogram were unremarkable. Ambulatory cardiac monitoring revealed an atrial tachycardia *(Figure 1)*. An electrophysiology study revealed left-sided pre-atrial contractions triggering atrial fibrillation and typical and atypical atrial flutter. Cardiac gated computed tomography disclosed no cardiac abnormality but revealed multiple pulmonary nodules *(Figure 2)*. An endobronchial ultrasound-guided fine-needle aspiration was consistent with pulmonary sarcoidosis *(Figure 3)*. Cardiac magnetic resonance imaging (MRI) revealed normal chamber sizes without evidence of myocardial scarring. She underwent radiofrequency ablation of the cavotricuspid isthmus and left common, right superior, and right inferior pulmonary vein isolation via cryoablation. Hydroxychloroquine was initiated 19 days later. She did not have atrial fibrillation or atrial flutter after ablation, and her loop recorder was explanted 3 years after implantation.

DISCUSSION

This is a novel case of pulmonary sarcoidosis presenting with atrial tachyarrhythmias. Srivatsa and Rogers described a 39-year-old man who presented with atrial fibrillation and was initially diagnosed with pulmonary sarcoidosis, but was eventually diagnosed with cardiac sarcoidosis as well.[5] The Heart Rhythm Society and the Japanese Ministry of Health and Welfare have published diagnostic criteria for cardiac sarcoidosis, which are inconsistent with the patient's workup.[6,7] While the patient may have had microscopic myocardial granulomas not seen on cardiac MRI, they are unlikely to play a clinically significant role in the presence of an otherwise normal electrophysiology study.[8]

Sarcoidosis carries a risk of arrhythmias independent of cardiac involvement. A large cohort analysis by Yafasova et al

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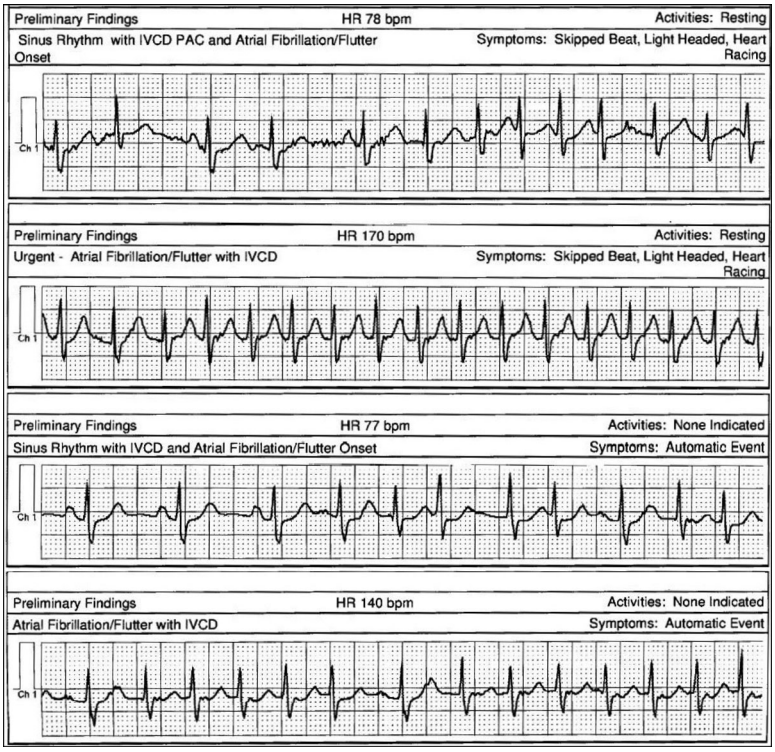

Figure 1. Rhythm strips from a 48-hour ambulatory cardiac monitor with an atrial arrhythmia ranging from 77 to 170 beats per minute.

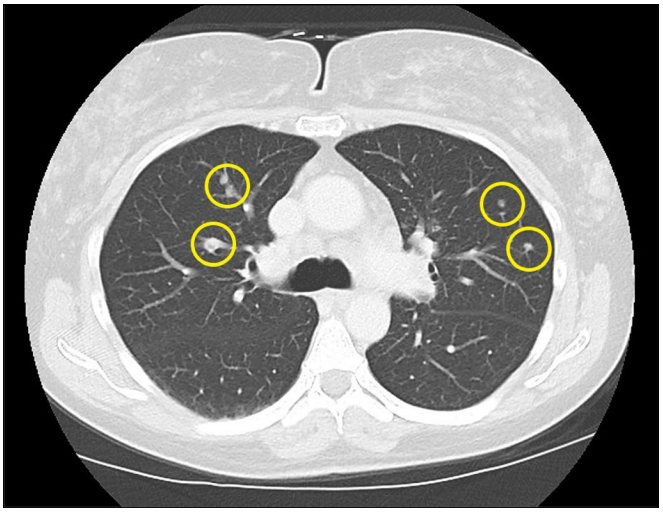

Figure 2. Transverse slice of a computed tomography scan revealing multiple pulmonary nodules (circled) in the bilateral upper pulmonary lobes.

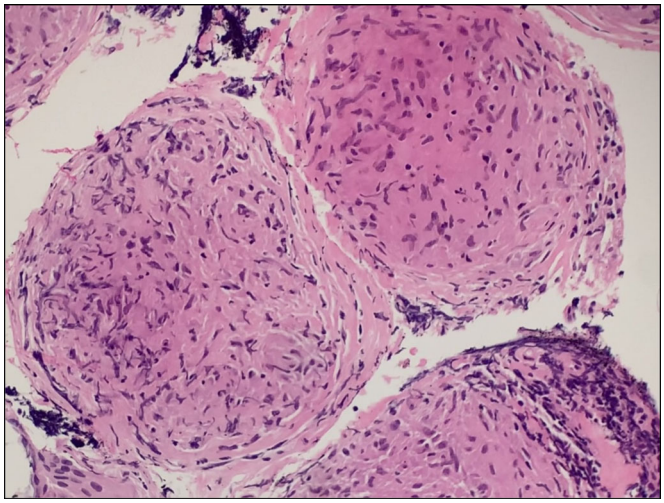

Figure 3. Right lower paratracheal lymph nodes obtained via fine needle aspiration revealing rare noncaseating granulomata within lymphoid tissue (hematoxylin and eosin stain, ×400).

found that patients with sarcoidosis had higher rates of cardiac arrhythmias, including atrial arrhythmias.[9] This also appears to be true for patients with only extracardiac sarcoidosis.[10] A retrospective analysis by Yodogawa et al found that only 40% of patients with cardiac sarcoidosis and atrial arrhythmias had atrial uptake on fluorodeoxyglucose positron emission tomography. However, left atrial size correlated with the presence of an atrial arrhythmia, suggesting that adverse cardiac remodeling, rather than primary cardiac sarcoidosis, may be playing a role.[11] A cohort analysis by Ungprasert et al found that the increased rates of atrial fibrillation in patients with sarcoidosis disappeared when adjusting for related comorbidities, suggesting that confounding risk factors may account for the increased prevalence of atrial fibrillation in sarcoidosis patients.[12] Ultimately, the exact etiology of cardiac arrhythmias in sarcoidosis patients remains unclear.

In conclusion, patients who present with new onset atrial fibrillation and have a family history of sarcoidosis may benefit from screening for pulmonary and cardiac sarcoidosis. Catheter-based ablation appears to be an effective treatment

for atrial arrhythmias in patients with extracardiac sarcoidosis.

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